Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.(Currently Amended) A method of transmitting data in a wireless ~~MC-CDMA~~ multi carrier system to a set of M users comprising the steps of:

providing a transmitter system with N sub-carriers divided into G groups, N and G each being integers greater than one;

determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of sub-carriers; and

for each user and in each group of sub-carriers, using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter.

2.(Original) A method as in claim 1, further comprising:

receiving the data at the MC-CDMA receiver, and

demodulating the received data using a demodulator that corresponds to the resource allocated at the transmitter.

3.(Currently Amended) A method according to ~~claim 1~~claim 4, in which user data bits are modulated with a modulation scheme corresponding to that user's group SNR and spread in frequency over said sub-carriers belonging to that user's group.

4.(Currently Amended) ~~A method according to claim 3, further comprising,~~ A method of transmitting data in a wireless multi carrier system to a set of M users comprising:

providing a transmitter system with N sub-carriers divided into G groups, N and G each being integers greater than one;

determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of sub-carriers;

for each user and in each group of sub-carriers, using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter; and

for each user, comparing the instantaneous group SNR of each group of sub-carriers with a pre-defined set of switching thresholds to determine bit allocations for the equivalent sub-carrier, and modulating each equivalent sub-carrier with a corresponding number of data bits, corresponding to the user's group SNR.

5.(Currently Amended) A method according to ~~claim 3~~claim 1, for each user, using the instantaneous group SNR of the user's group of sub-carriers, calculating bit and power allocation for each equivalent sub-carrier and modulating each equivalent sub-carrier with a corresponding number of data bits, corresponding to the user's group SNR.

6.(Original) A method according to claim 1, further comprising the step of, for each user and in each group of sub-carriers, regarding the instantaneous group SNR as the instantaneous SNR of an equivalent single sub-carrier to the group.

7.(Currently Amended) A method according to claim 4, in which

any groups of sub-carriers having a group SNR below a first switching threshold are not modulated;

at least one group of sub-carriers having a first group SNR above said first switching threshold is modulated with a first number of data bits according to a first modulation scheme; and

at least one group of sub-carriers of said G groups having a second group SNR next above said first group SNR is modulated with a second number of data bits according to a second modulation scheme.

8.(Original) A method according to claim 4, in which at least one switching threshold between at least two SNRs is chosen to satisfy a performance criterion of a system.

9.(Currently Amended) A method according to ~~claim 1~~claim 11, in which user data bits for each user in each group of modulated sub-carriers are modulated by a modulation scheme corresponding to the user's group SNR, then spread with a spreading code associated with that user, and loaded into the sub-carriers of the user's group.

10.(Canceled)

11.(Currently Amended) ~~A method according to claim 9, further comprising a step of~~ A method of transmitting data in a wireless multi carrier system to a set of M users comprising:

providing a transmitter system with N sub-carriers divided into G groups, N and G each being integers greater than one;

determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of sub-carriers;

for each user and in each group of sub-carriers, using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter; and

adding ~~the~~ chips from all users synchronously across all the sub-carriers in said G groups, on a sub-carrier-by-sub-carrier basis and then transmitting an OFDM symbol formed by the addition of said chips.

12.(Previously Presented) A method according to claim 3, further comprising

calculating for each user an effective channel function;

calculating from said effective channel function a group SNR of the sub-carriers in said effective channel function; and

comparing the instantaneous group SNR of each group of sub-carriers with a pre-defined set of switching thresholds to determine the bit allocations for the equivalent sub-carrier, and modulating each equivalent sub-carrier with a corresponding number of data bits, corresponding to said group SNR.

13-18.(Canceled)

19.(Currently Amended) A transmitter for wirelessly transmitting data to a set of M users comprising:

a modulator for modulating N sub-carriers that are divided into G groups, N and G each being integers greater than one;

circuitry for calculating an instantaneous group SNR using an effective channel function for each user in each group of sub-carriers; and

resource allocation means for allocating, using said instantaneous SNR of an equivalent single sub-carrier as a metric, at least one resource for each user and in each group of sub-carriers.

20.(Currently Amended) A transmitter as in ~~claim 19~~claim 29, further comprising:

at least one MC-CDMA receiver for receiving data over resources allocated using an instantaneous SNR of an equivalent single sub-carrier as a metric; and

a demodulator that corresponds to the allocated resources for demodulating the received data.

21.(Previously Presented) A transmitter according to ~~claim 19, in which~~ claim 22, wherein the modulator modulates data bits with a modulation scheme corresponding to said group SNR, and the transmitter further comprising a spreader for spreading the unmodulated data bits in frequency over said sub-carriers belonging to said group.

22.(Currently Amended) ~~A transmitter according to claim 21, further comprising~~ A transmitter for wirelessly transmitting data to a set of M users comprising:

a modulator for modulating N sub-carriers that are divided into G groups, N and G being integers;

circuitry for calculating an instantaneous group SNR using an effective channel function for each user in each group of sub-carriers; and

resource allocation means for allocating, using said instantaneous SNR of an equivalent single sub-carrier as a metric, at least one resource for each user and in each group of sub-carriers; and

means for comparing the instantaneous group SNR of each group of sub-carriers received by each user with a pre-defined set of switching thresholds to determine the bit allocations for the equivalent sub-carriers of said each user; ~~and~~

wherein the modulator operates to modulate each equivalent sub-carrier with a number of data bits corresponding to said group SNR.

23.(Previously Presented) A transmitter according to claim 21, wherein the circuitry for calculating further calculates bit and power allocation, for each user using the instantaneous group SNR of each group of sub-carriers, for each equivalent sub-carrier and modulating each equivalent sub-carrier with a corresponding number of data bits, corresponding to said group SNR.

24.(Currently Amended) A transmitter according to claim 19, wherein the circuitry for calculating further calculates, for each user and in each group of sub-carriers, said SNR is calculated by regarding said instantaneous group SNR as the instantaneous SNR of an equivalent single sub-carrier.

25.(Currently Amended) A transmitter according to claim 22, in which the modulator does not modulate any groups of sub-carriers having a group SNR below a first switching threshold;

the modulator modulates with a first number of data bits according to a first modulation scheme at least one group of sub-carriers having a first group SNR above said first switching threshold; and

the modulator modulates with a second number of data bits according to a second modulation scheme at least one group of sub-carriers of said G groups having a second group SNR next above said first group SNR.

26.(Currently Amended) A transmitter according to claim 22, in which the circuitry for calculating operates to select at least one switching threshold between at least two SNRs is chosen so as to satisfy a performance criterion.

27-28.(Canceled)

29.(Currently Amended) ~~A transmitter according to claim 20, further comprising~~ A transmitter for wirelessly transmitting data to a set of M users comprising:

a modulator for modulating N sub-carriers that are divided into G groups, N and G each being integers greater than one;

circuitry for calculating an instantaneous group SNR using an effective channel function for each user in each group of sub-carriers;

resource allocation means for allocating, using said instantaneous SNR of an equivalent single sub-carrier as a metric, at least one resource for each user and in each group of sub-carriers; and

means for adding chips from all users synchronously across all the sub-carriers in said G groups, on a sub-carrier-by-sub-carrier basis and then transmitting an OFDM symbol formed by the addition of said chips.

30.(Currently Amended) A transmitter according to claim 19, wherein the circuitry for calculating further calculates, for each user, said effective channel function and calculating therefrom said group SNR of the sub-carriers in said effective channel function.

31-40.(Canceled)

41.(Previously Presented) A transmitter according to claim 19 disposed in a mobile station.

42.(Previously Presented) A transmitter according to claim 19 disposed in a base station of a cellular communication system.

43.(Currently Amended) A program of machine-readable instructions, tangibly embodied on an information bearing medium and executable by a digital data processor, to perform actions directed toward transmitting data in a wireless multi-carrier ~~spread spectrum~~ communication system, the actions comprising:

providing a transmitter system with N sub-carriers divided into G groups, N and G each being integers greater than one;

determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of sub-carriers; and

for each user and in each group of sub-carriers, using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter.

44.(Currently Amended) A program of machine-readable instructions according to claim 43, wherein the actions further comprise:

receiving the data at ~~the~~an MC-CDMA receiver, and

demodulating the received data using a demodulator that corresponds to the resource allocated at the transmitter.

45.(Currently Amended) A program of machine-readable instructions according to ~~claim 43~~claim 46, in which user data bits are modulated with a modulation scheme corresponding to that user's group SNR and spread in frequency over said sub-carriers belonging to that user's group.

46.(Currently Amended) ~~A program of machine readable instructions according to claim 45, wherein the actions further comprise:~~ A program of machine-readable instructions, tangibly embodied on an information bearing medium and executable by a digital data processor, to perform actions directed toward transmitting data in a wireless multi-carrier communication system, the actions comprising:

providing a transmitter system with N sub-carriers divided into G groups, N and G each being integers greater than one;

determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of sub-carriers; and

for each user and in each group of sub-carriers, using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter;

for each user, comparing the instantaneous group SNR of each group of sub-carriers with a pre-defined set of switching thresholds to determine bit allocations for the equivalent sub-carrier; and

modulating each equivalent sub-carrier with a corresponding number of data bits, corresponding to the user's group SNR.

47.(Previously Presented) A program of machine-readable instructions according to claim 45, wherein for each user using the instantaneous group SNR of the user's group of sub-carriers, calculating bit and power allocation for each equivalent sub-carrier and modulating each

equivalent sub-carrier with a corresponding number of data bits, corresponding to the user's group SNR.

48.(Previously Presented) A program of machine-readable instructions according to claim 43, wherein the actions further comprise:

for each user and in each group of sub-carriers, regarding the instantaneous group SNR as the instantaneous SNR of an equivalent single sub-carrier to the group.

49.(Currently Amended) A program of machine-readable instructions according to claim 46, wherein the actions further comprise:

any groups of sub-carriers having a group SNR below a first switching threshold are not modulated;

modulating at least one group of sub-carriers of said G groups, having a first group SNR above said first switching threshold, with a first number of data bits according to a first modulation scheme; and

modulating at least one group of sub-carriers of said G groups, having a second group SNR next above said first group SNR, with a second number of data bits according to a second modulation scheme~~; and~~

~~the actions not including modulating any groups of sub-carriers having a group SNR below a switching threshold~~.

50.(Previously Presented) A program of machine-readable instructions according to claim 46, wherein the actions further include selecting at least one switching threshold between at least two SNRs so as to satisfy a performance criterion of a system.

51.(Previously Presented) A program of machine-readable instructions according to claim 43, wherein the actions further comprise:

modulating user data bits for each user in each group of modulated sub-carriers by a modulation scheme corresponding to the user's group SNR; and

spreading the modulated user bits with a spreading code associated with that user; and

loading the spread and modulated user bits into the sub-carriers of the user's group.

52.(Currently Amended) ~~A program of machine-readable instructions according to claim 51, wherein the actions further comprise:~~ A program of machine-readable instructions, tangibly embodied on an information bearing medium and executable by a digital data processor, to perform actions directed toward transmitting data in a wireless multi-carrier spread spectrum communication system, the actions comprising:

providing a transmitter system with N sub-carriers divided into G groups, N and G each being integers greater than one;

determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of sub-carriers; and

for each user and in each group of sub-carriers, using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter;

modulating user data bits for each user in each group of modulated sub-carriers by a modulation scheme corresponding to the user's group SNR;

spreading the modulated user bits with a spreading code associated with that user;

loading the spread and modulated user bits into the sub-carriers of the user's group by adding chips from all users synchronously across all the sub-carriers in said G groups, on a sub-carrier-by-sub-carrier basis; and

transmitting an OFDM symbol formed by the addition of said chips.